

TYPHOON JUDY (01W)

The formation of Typhoon Judy marked the start of the western North Pacific tropical cyclones for 1986. Judy originated near two degrees North Latitude in the near-equatorial trough. It was aided in its initial development by brisk northeasterly trade flow associated with a shear line situated to the north and the low latitude monsoonal westerlies in the southern hemisphere. Judy was also the season's first tropical cyclone to enter the mid-latitude westerlies and recurve.

During most of January, a winter weather pattern dominated the tropical western North Pacific area. Convective activity was confined to low latitudes on the periphery of the near-equatorial trough (NET). In the last week of January, the NET extended from the southern Philippines east-southeast to the equator 420 nm (778 km) south-southeast of the island of Pohnpei.

The cloud system first appeared late on 25 January as an area of disorganized convection 300 nm (556 km) in diameter. With unrestricted upper-level outflow to the north and west, the convection persisted through the diurnal minimum period (around 0400Z) on the 26th and was first noted on the Significant Tropical Weather Advisory (ABPW PGTW) at 260600Z.

During the next three days, the convection continued a gradual increase in areal extent, but

remained poorly organized. Early on 29 January, an aircraft reconnaissance investigative mission flown into the disturbance was unable to locate a low-level circulation center. However, the Aerial Reconnaissance Weather Officer (ARWO) estimated a minimum sea-level pressure (MSLP) in the area at 1001 mb. Since this pressure was approximately 6 mb below the surrounding environmental MSLP to the north and the disturbance was expected to track westward into an upper-level environment with less vertical wind shear, a Tropical Cyclone Formation Alert (TCFA) was issued at 290630Z.

A second investigative mission flown early on the 30th also failed to locate a definite low-level circulation. The ARWO estimated maximum surface winds of 25 kt (13 m/sec) to 35 kt (18 m/sec) to the north in the easterly flow. Satellite imagery and synoptic data indicated this enhanced flow was a result of a shear line to the north of the disturbed area. Because of a decrease in both convection (diurnal) and low-level inflow, the TCFA for the disturbance was cancelled at 300600Z.

Post analysis indicates this cancellation was premature. Satellite imagery, over the next forty-eight hours, detected a dramatic increase in convection associated with this slowly westward moving disturbance. Analysis of satellite imagery (Figure 3-01-1) prompted the issuance of a second

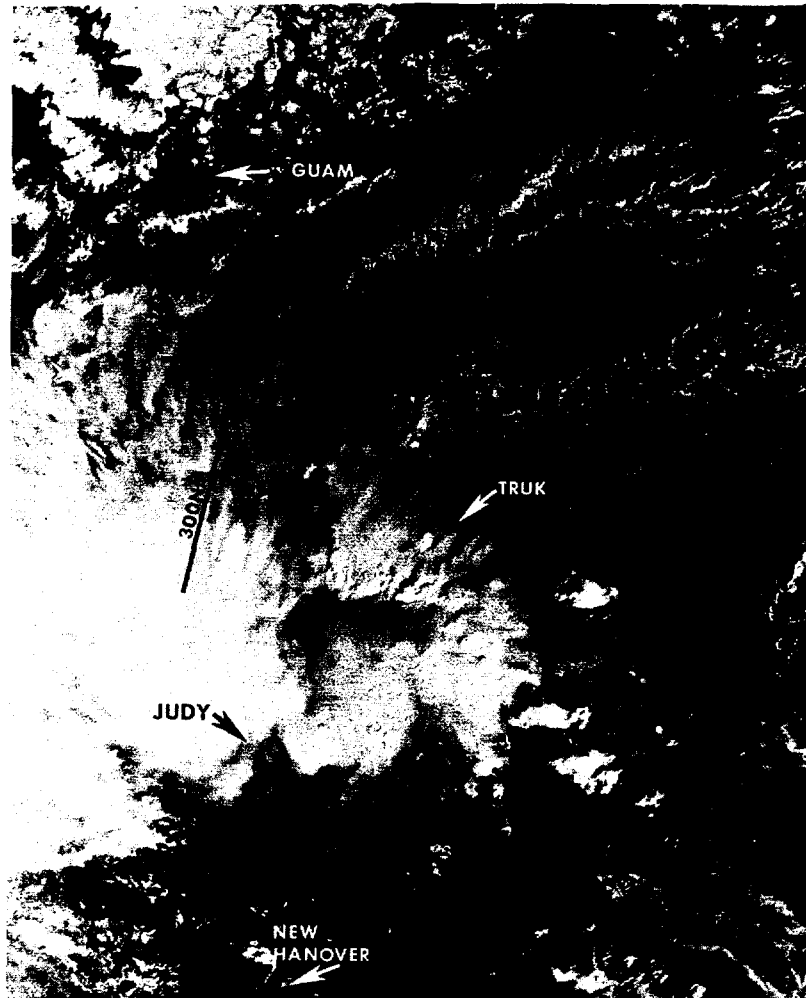


Figure 3-01-1. Judy just prior to issuance of second TCFA (302349Z January DMSP visual imagery).

TCFA at 310130Z. Twenty-four hours later, infrared satellite imagery indicated a upper-level anticyclone was developing over the disturbance and (Dvorak) satellite intensity analysis estimated surface winds of 30 kt (15 m/sec). This prompted the initial warning at 010000Z on Judy, as a 30 kt (15 m/sec) tropical depression. Within twenty-four hours, Judy was upgraded to tropical storm intensity based on the aircraft reconnaissance data.

The initial forecasts called for Judy to track west-northwestward. Due to the uncertainty of the position of the ridge axis and its strength over the data sparse Philippine Sea, 400 mb synoptic tracks were flown on the 2nd and 3rd of February to help define the mid-level flow north of Judy. Data from these flights confirmed the presence of the east-west orientation of the ridge axis and indicated a weakness in the ridge along 130 degrees East Longitude with strong westerly mid-level flow north of 16 degrees North Latitude. With the above information and mindful of a similar synoptic pattern associated with Typhoon Hope in December 1985, JTWC

altered the forecast to reflect initial northward movement followed by recurvature toward the northeast. As with Typhoon Hope (1985), Judy was expected to undergo a rapid extratropical transition with a drastic decrease in intensity and no significant eastward movement. The dynamic forecast guidance proved of no assistance in this regard apparently due to the strongly sheared/baroclinic environment.

Judy slowed slightly as it approached the ridge near 131 degrees East Longitude early on 3 February. Continuing to intensify, the system tracked north briefly before turning northeast. Judy reached its maximum intensity of 85 kt (44 m/s) with a MSLP of 974 mb at 050000Z (see Figure 3-01-2). As it reached maximum intensity, Judy also came under the influence of strong mid-latitude westerlies. By 060000Z, Judy's convection had been sheared away and extratropical transition was complete. The nearly convective free low-level circulation drifted slowly east-northeast and dissipated. No deaths, injuries or property damage were attributed to Typhoon Judy.

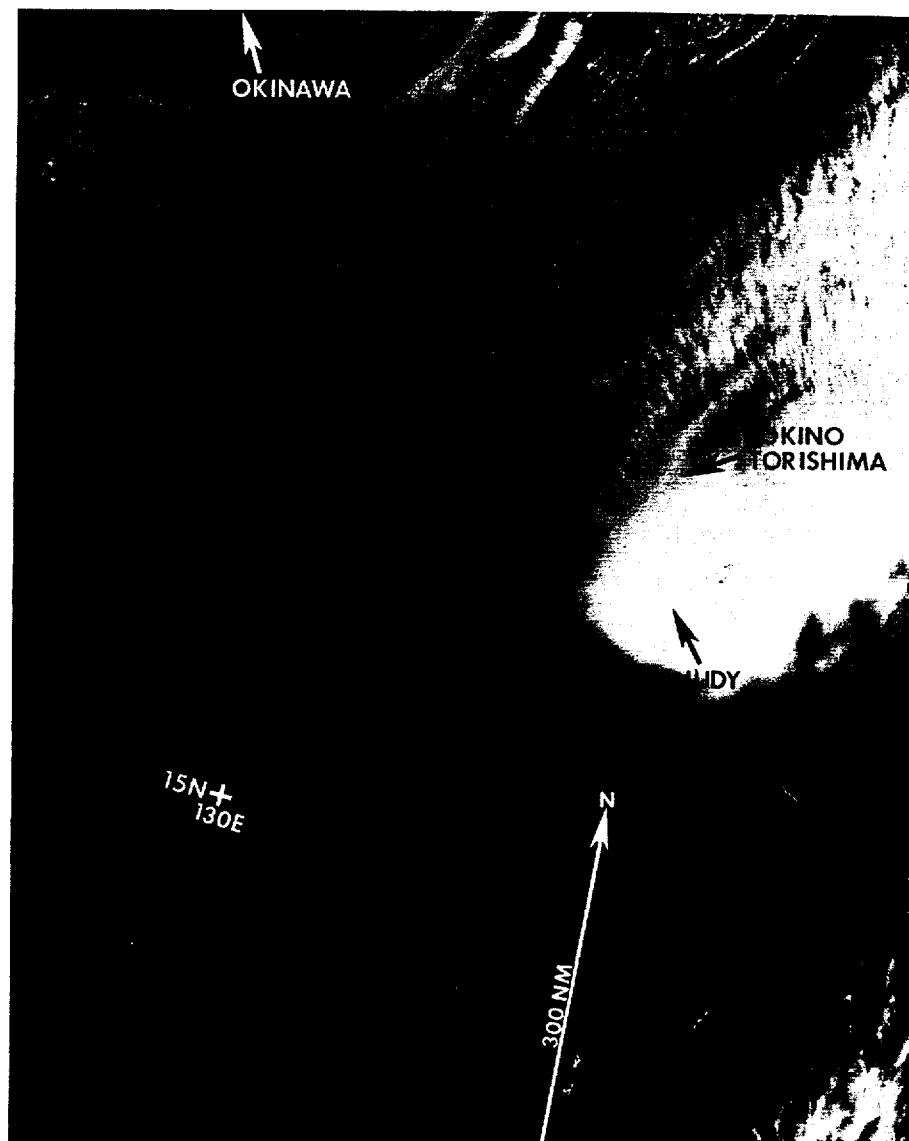


Figure 3-01-2. Typhoon Judy near maximum intensity (050120Z February DMSP visual imagery).